

WHAT IS CLAIMED IS

1. A radio wave propagation characteristics estimating system for determining the frequency transfer function of the radio wave by 5 estimating the radio wave propagation characteristics on the basis of a ray tracing technique of tracing the courses of a plurality of the rays which approximate to the radio wave radiated from a transmission point and detecting the rays arriving at a reception point, said system comprising:

first means for dividing the spectrum of a radio signal of a target radio 10 communication system into a plurality of bands and determining the frequency transfer function of a predetermined frequency of each of said plurality of bands by said radio wave propagation characteristics estimation, said predetermined frequency of each of said plurality of bands being used as a frequency of the radio wave radiated from said transmission point; and

15 second means for estimating the radio wave propagation characteristics of said target radio communication system on the basis of the frequency transfer functions determined by said first means.

2. The system according to claim 1, wherein said second means estimates said radio wave propagation characteristics by filtering the 20 frequency transfer functions determined by said first means with band pass filters having pass bands respectively corresponding to the plurality of bands obtained by dividing the spectrum, and arranging and synthetically combining the filtered frequency transfer functions on a frequency axis.

3. The system according to claim 1, wherein said first means 25 comprises third means for acquiring information on the arrival delay time and

intensity of each of the rays arriving at said reception point for each of said predetermined frequencies by estimating said radio wave propagation characteristics and determines the frequency transfer function for each of said predetermined frequencies on the basis of the information acquired by said 5 third means.

4. The system according to claim 3, wherein said third means acquires information for each of said predetermined frequencies by tracing the courses of said plurality of rays only once.

5. The system according to claim 3, wherein said third means is 10 provided for each of a plurality of directions to which the rays are radiated from the transmission point so as to carry out in parallel.

6. The system according to claim 1, wherein the number of a plurality of said predetermined frequencies is set on the basis of the extent of said spectrum of radio signal.

15 7. The system according to claim 6, wherein the extent of said spectrum of radio signal is the bandwidth of said spectrum of radio signal.

8. The system according to claim 6, wherein the extent of said spectrum of radio signal is the band distribution of said spectrum of radio signal.

20 9. The system according to claim 6, wherein the extent of said spectrum of radio signal is the bandwidth of said spectrum of radio signal having power over the power smaller than the largest power of the spectrum by a predetermined value.

10. A radio wave propagation characteristics estimating method 25 for determining the frequency transfer function of the radio wave by

estimating the radio wave propagation characteristics on the basis of a ray tracing technique of tracing the courses of a plurality of the rays which approximate to the radio wave radiated from a transmission point and detecting the rays arriving at a reception point, said method comprising:

5 a first step for dividing the spectrum of a radio signal of a target radio communication system into a plurality of bands and determining the frequency transfer function of a predetermined frequency of each of said plurality of bands by said radio wave propagation characteristics estimation, said predetermined frequency of each of said plurality of bands being used as
10 a frequency of the radio wave radiated from said transmission point; and

a second step for estimating the radio wave propagation characteristics of said target radio communication system on the basis of the frequency transfer functions determined by said first step.

11. The method according to claim 10, wherein said radio wave
15 propagation characteristics are estimated in said second step by filtering the frequency transfer functions determined in said first step with band pass filters having pass bands respectively corresponding to the plurality of bands obtained by dividing the spectrum, and arranging and synthetically combining the filtered frequency transfer functions on a frequency axis.

20 12. The method according to claim 10, wherein said first step comprises a third step of acquiring information on the arrival delay time and intensity of each of the rays arriving at said reception point for each of said predetermined frequencies by estimating said radio wave propagation characteristics, and the frequency transfer function for each of said
25 predetermined frequencies on the basis of the information acquired in said

third step is determined in said first step.

13. The method according to claim 12, wherein said information is acquired for each of said predetermined frequencies by tracing the courses of said plurality of rays only once in said third step.

5 14. The method according to claim 12, wherein said third step is provided for each of a plurality of directions to which the rays are radiated from the transmission point so as to carry out in parallel.

10 15. The method according to claim 10, wherein the number of a plurality of said predetermined frequencies is set on the basis of the extent of said spectrum of radio signal.

16. The method according to claim 15, wherein the extent of said spectrum of radio signal is the bandwidth of said spectrum of radio signal.

15 17. The method according to claim 15, wherein the extent of said spectrum of radio signal is the band distribution of said spectrum of radio signal.

18. The method according to claim 15, wherein the extent of said spectrum of radio signal is the bandwidth of said spectrum of radio signal having power over the power smaller than the largest power of the spectrum by a predetermined value.

20 19. A program product embodied on a storage portion of a computer and comprising code that, when said program product is executed, cause said computer to perform a radio wave propagation characteristics estimating method, said method determining the frequency transfer function of the radio wave by estimating the radio wave propagation characteristics on 25 the basis of a ray tracing technique of tracing the courses of a plurality of the

rays which approximate to the radio wave radiated from a transmission point and detecting the rays arriving at a reception point, said method comprising:

5 a first step for dividing the spectrum of a radio signal of a target radio communication system into a plurality of bands and determining the frequency transfer function of a predetermined frequency of each of said plurality of bands by said radio wave propagation characteristics estimation, said predetermined frequency of each of said plurality of bands being used as a frequency of the radio wave radiated from said transmission point; and

10 a second step for estimating the radio wave propagation characteristics of said target radio communication system on the basis of the frequency transfer functions determined by said first step.